Remarks/Arguments

Claims 1, 3-4, and 7-9 are pending and under examination in this application.

The Examiner continues to reject claims 1, 3, and 9 under 35 U.S.C. §102(b) as anticipated by Kayamoto et al., U.S. Pre Grant Publication No. 2003/0186156 ("the Kayamoto '156 publication."). The Examiner has rejected our arguments that the spherical ferrite particles disclosed in the Kayamoto '156 publication have significantly less surface uniformity than the spherical ferrite particles that are used as part of the claimed invention because the sintering furnace used in producing the spherical ferrite particles in the Kayamoto '156 publication is different than the sintering furnace used in the present case. Specifically, the Examiner points out that Table 1 in Example 1 of the Kayamoto '156 publication shows a spherical ferrite particle with a surface uniformity of 96%, and argues that this falls within the range recited in claim 1.

Applicants note that a spherical ferrite particle with a surface uniformity of 96% is not disclosed Kayamoto '156 publication, but is disclosed in Example 1 of Table 1 of the *present* application, which also lists Kanao Kayamoto as the first inventor. Table 3 of the Kayamoto '156 publication is the only table in that document that discloses surface smoothness uniformity, and the Kayamoto '156 publication does not disclose a spherical ferrite particle with a surface smoothness uniformity of greater than 90%. As such, the Kayamoto '156 publication cannot anticipate the present claims.

As was already argued in the Response to the Non-Final Office Action mailed on March 9, 2009, which was filed on July 7, 2009, the firing step disclosed in the Kayamoto '156 publication is significantly different from the firing step used in producing the spherical ferrite particles recited in claim 1. The firing step used to produce the spherical ferrite particles taught in the Kayamoto '156 publication is performed in an electric oven capable of creating a firing atmosphere, which results in a surface uniformity of between 80 and 90 percent (see Examples 1-3 described in Table 3 of the Kayamoto '156 publication). In

contrast, the present application teaches that the spherical ferrite particles are sintered in a rotary kiln, which results in a surface uniformity of 92% to 100% (see Examples 1-3 in Table 1 of the present application). In addition, according to the present application, sintering granules in an electric furnace rather than a rotary kiln results in particles with a surface uniformity between 71% and 80% (see Comparative Examples 1-3 in Table 1 of the present application).

Further, as is apparent from Table 1 of the present application, Examples 1 and 2 use a rotary kiln for both pre-sintering and sintering, while Comparative Examples 1 to 3 in the present application use an electric furnace for sintering. When the results disclosed in Examples 1 and 2 are compared with the results of Comparative Examples 1-3, it becomes clear that the results disclosed in Comparative Examples 1-3 are not particles according to the present claims. Comparative Example 3 does not have an average sphericity of 1 to 1.3, and Comparative Examples 1-3 do not have a sphericity standard deviation of 0.125 or less. Likewise, the spherical ferrite particles made by the processes of Comparative Examples 1-3 do not have a scattered material magnetization of 80% or more of a main body magnetization, as is recited in claim 1.

As such, the spherical ferrite particles disclosed in the Kayamoto '156 publication do not have the surface uniformity recited in claim 1, and thus cannot anticipate claim 1. Since claims 3 and 9 depend from claim 1, it is clear that the Kayamoto '156 publication does not anticipate the present invention.

Furthermore, the resin-coated carrier disclosed in the Kayamoto '156 publication does not render the present claims obvious. Nothing taught by the Kayamoto '156 publication indicates that a low sphericity standard deviation is desirable, nor does any teaching in the Kayamoto '156 publication indicate how to achieve a low sphericity standard deviation. There is no reference or teaching of record that shows that one of ordinary skill in the art would be motivated to modify the teachings of the Kayamoto '156 publication in order to arrive at a resin-coated carrier with a sphericity standard deviation of less than 0.125. Further, the Kayamoto '156 publication does not teach how one would be able to increase the surface uniformity of the particles to between 92% to 100%. The

Kayamoto '156 publication teaches that a high degree of surface uniformity is desirable; however, they are unable to achieve a resin-coated ferrite carrier with a surface uniformity of greater than 90% using the production methods taught. See Example 3 of the Kayamoto '156 publication. The art cited in the present rejection provides no guidance or direction as to how to increase the surface uniformity of spherical ferrite particles beyond 90%. As such, the invention of the present claims cannot be obvious over the Kayamoto '156 publication.

The Examiner has also rejected claims 4 and 7-9 under 35 U.S.C. §103(a) as unpatentable over the Kayamoto '156 publication in view of Mizutani et al., U.S. Pre Grant Publication No. 2005/0214671 ("the Mizutani '671 publication"). The Examiner argues that claims 4 and 7-8 would be obvious over the combination of the Kayamoto '156 publication and the Mizutani '671 publication The Examiner argues that the Kayamoto '156 publication fails to teach a method of making an electrophotographic developer characterized by the step of sintering the granules while the granules are made to flow by fluidizing means, but that the Mizutani '671 publication discloses a process of forming a carrier comprising a ferrite core particle which is formed by sintering in a rotary kiln at a temperature from 1100° to 1500° C, in order to produce a spherical core with a smooth surface. Applicants traverse.

Applicants note that the Mizutani '671 publication is not prior art to the present application. The Mizutani '671 publication was filed in the United States on October 13, 2004, which is slightly over a month prior to the filing of the present application, which was filed as a PCT Application on November 25, 2004. However, the Mizutani '671 publication was filed after JP-03-424762, which was filed on December 22, 2003, to which the present application claims priority. Applicants submit herewith a translation of the priority document JP-03-424762, and a certification of such translation as accurate. Written description for claim 1 may be found in claim 1 of the priority document, as well as in Table 1 on page 27. Written description for claim 3 may be found in claim 2 of the priority document. Written description for claim 9 may be found in claim 3 of the priority document. Written description for claims 4 and 7 may be found in claim 4

of the priority document as well as in paragraph [0031]-[0032] on page 12 of the priority document; written description for claim 8 may be found in Example 1. As such, the Mizutani ’671 publication cannot be prior art to the present application.

However, in addition, it is clear that one of ordinary skill in the art would not be motivated to modify the teachings of the Kayamoto ’156 publication by combining them with the teachings of the Mizutani ’671 publication to arrive at the process of the present invention. Claim 4 of the present application recites the following:

> A process for producing a resin-coated carrier for an electrophotographic developer, the process comprising weighing and mixing ferrite raw materials, crushing the mixture, granulating the obtained slurry, sintering the granules, and coating the sintered material, with a resin, characterized in that the granules are pre-sintered at 500 to 700 ºC before sintering, the sintering is performed for 0.1 to 5 hours at a sintering temperature of 1200 to 1400 ºC while the granules are made to flow by fluidizing means.

The Mizutani ’671 publication discloses a method for forming an image that does not induce problems, such as charging failure, and prevents deterioration in image quality, such as white dropout of an image, caused by attachment of a discharge product or a residual toner remaining on the surface of an electrostatic latent image carrying member. (See paragraph [0018]). In order to solve this problem, the Mizutani ’671 publication discloses a developer including a carrier and a toner including an external additive; the carrier has a median of an arithmetic average height distribution from 0.45 to 0.65 μm, and the toner has average circularity of 0.975 or more. (See paragraph [0019] of the Mizutani ’671 publication).

One of ordinary skill in the art would not be motivated to combine the teachings of the Mizutani ’671 publication with the method taught by the Kayamoto ’156 publication because the Mizutani ’671 publication discloses that it is undesirable to have a highly smooth surface, i.e. a surface with a high degree of surface uniformity, while the Kayamoto ’156 publication teach that a high degree of surface uniformity is necessary to generate uniform particles and to prevent scattering. In order to prevent residual toner from remaining on the

surface of the electrostatic latent image carrying member, the Mizutani '671 publication discloses that it is important to control the arithmetic average height distribution of the carrier particles. The Mizutani '671 publication discloses that, if the average arithmetic height distribution of the carrier particles is less than 0.45 μm, excess toner cannot be scraped off at the developing nip part, thereby maintaining the surface of the carrying member in a clean state. (See paragraph [0047] of the Mizutani '671 publication). As such, the object of the invention of the Mizutani '671 publication is not to make a resin-coated carrier with a high-degree of smoothness, but instead to make a resin-coated carrier *with a controlled degree of roughness* between particular parameters. One of ordinary skill in the art would not be motivated to combine the teachings of the Mizutani '671 publication with the teachings of the Kayamoto '156 publication, because the Kayamoto '156 publication specifically discloses that a high degree of surface uniformity is necessary to prevent wide particle-to-particle variation and particle scattering (see paragraph [0025] of the Kayamoto '156 publication).

Furthermore, the Mizutani '671 publication offers no guidance that would lead one of ordinary skill in the art to select a rotary kiln in order to increase surface smoothness. The Mizutani '671 publication merely teach that, in making a carrier, granulated pellets may be sintered in an electric furnace, a rotary kiln, or a batch sintering furnace, and that surface irregularity may be adjusted by controlling various conditions such as the property of raw materials, the additives, calcination conditions, sintering conditions, and pulverization conditions. (See paragraph [0066] of the Mizutani '671 publication). The Mizutani '671 publication does not specifically teach that selecting a rotary kiln will increase surface smoothness, and instead indicates that higher temperatures will generate greater surface smoothness rather than the choice of any particular furnace. (See Paragraph [0066] of the Mizutani '671 publication). One of ordinary skill in the art would thus not be motivated to modify the method taught by the Kayamoto '156 publication by replacing the electric furnace used by the Kayamoto '156 publication with a rotary kiln based on the teachings of the Mizutani '671 publication. As such, these two references do not render claims 4-8 obvious.

Further, the Mizutani '671 publication does not render claim 8 obvious. A particular range or parameter must first be recognized as a result effective variable, i.e. a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antoine*, 559 F.d 618 (CCPA 1977); see also Manual of Patent Examining Procedure §2144.05.I.B (8^{th} Ed 7^{th} Rev. 2009). The Mizutani '671 publication does not teach using a rotary kiln with a retort rotation speed of 0.5 to 10 rpm, a retort inclination of 0.5 to 4º, an inlet hammering frequency of 10 to 300 times/minute, or an outlet hammering frequency of 10/300 times/minute. Further, the Mizutani '671 publication does not even teach that these are variables which may be optimized in order to produce particles of a particular quality. The Kayamoto '156 publication does not teach use of a rotary kiln at all, and does not teach these operating parameters for a rotary kiln. As such, claim 8 cannot be obvious over the Kayamoto '156 publication in view of the Mizutani '671 publication.

In view of the remarks, it is submitted that the present application is now in condition for allowance. Reconsideration and allowance of the pending claims are requested. The Director is authorized to charge any fees or overpayment to Deposit Account No. 02-2135.

Respectfully submitted,

By /Robert B. Murray/
Robert B. Murray
Attorney for Applicants
Registration No. 22,980
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
Suite 800, 1425 K Street, N.W.
Washington, D.C. 20005
Telephone: (202)783-6040
Facsimile: (202)783-6031